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**RENAL AND CREATININE INSUFFICIENCY IN  
ALKALOSIS**

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The periodic appearance in literature of renal insufficiency following alkalosis during the treatment of duodenal ulcers has increased since Hardt and Rivers (1923) first described toxic manifestations. Previous to this time, Sellards (1912) reported that alkalis are not tolerated in renal diseases.

The long-continued administration of alkalis in animals has been carried out by Addis, MacKay and MacKay (1926), who gave rats four grams of sodium bicarbonate per diem mixed with a normal diet, over periods of nearly a year. The control group of 78 contained 2 cases of haematuria, while the alkalinized group of 72 had 24 cases of marked haematuria, and in addition, 7 of the 24 rats with haematuria had hydronephrosis of one or both kidneys.

Nuzum, Seegal, Garland and Osborne (1926) fed animals on "highly artificial diets," including soya beans, which caused an alkalosis and found that "long-continued disturbance of the acid-base balance of rabbits on the alkaline side is capable of causing a moderate hypertension and kidney damage."

Stieglitz (1928) considered that an alkalosis produced by long-continued or excessive administration of alkalis would cause distinct renal irritation and occasionally a true nephrosis.

Oakley (1935) stated that in the treatment of peptic ulcer, it is imperative to keep in mind the possibility that alkalosis may develop in any patient taking alkalis regularly, even in moderate doses.

Steele (1936) reported a case of renal insufficiency developing during prolonged use of alkalis. This case was carefully observed and reported over a period of two and one-half years. The patient showed no neurologic manifestations of alkalosis such as nausea, headache, nervousness or tetany. The renal damage was noted in frequent urinalysis which contained albumin, erythrocytes and casts. The renal insufficiency was progressive as shown by the periodic increase in urea clearance. The patient recovered after the discontinuance of the alkali medications.

Since the advent of Folin's colorimetric method for the estimation of creatinine in urine in 1904, there has been a constant increase of information regarding this interesting nitrogenous waste product. Folin was the first to show that the amount of creatinine excreted in the urine by a normal individual on a meat-free diet is quite independent of either the amount of protein in the food or of the total nitrogen in the urine, the amount excreted from day to day being practically constant for each individual, thus pointing conclusively to its endogenous origin. He further noted that the more obese the subject, the less creatinine is excreted per kilo of body weight and concluded from this that the amount of creatinine excreted depends primarily upon the mass of active protoplasmic tissue, or, as Shaffer (1908) has expressed it, "creatinine is derived from some special process in normal metabolism taking place largely, if not wholly, in the muscles, and upon the intensity of this process appears to depend the muscular efficiency of the individual." Creatinine is the anhydride of creatine, the chief non-protein nitrogenous constituent of the muscle tissue of vertebrate animals. That the creatinine of the urine has its origin in the creatine of the muscle tissue would seem obvious, but a definite proof of this hypothesis has been beset with many difficulties.

Shaffer believes that creatinine is the result of some special process of normal metabolism which takes place to a large extent in the muscles, and further that the amount of such creatinine elimination, expressed in milligrams per kilogram body weight, is an index of this special process.

Myers and Fine (1913) stated that creatinine is formed in the muscle tissue from creatine and at a very constant rate. The human kidneys are unable to maintain a threshold for creatinine, therefore it is secreted as rapidly as produced. Under normal conditions about 1.2 grams of creatinine is excreted by an adult in

twenty-four hours. Clinical laboratories have utilized this fact to determine the presence in a complete twenty-four hour specimen of urine.

The muscle tissue normally contains more creatinine than any other body tissue and is followed by the blood, which indicates that after its formation in the muscle the creatinine is carried to the kidneys by the blood stream. The exceptions to this statement is found in uremia where the creatinine content of the blood may slightly exceed that of the muscle and in alkalosis where the creatinine content of the blood shows a deficiency.

Rauth (1923) found that the creatinine content of urine is relatively constant in normal individuals. He showed that it varied with the total nitrogen output, which was controlled by diet in two cases of dystrophia adiposogenitalis. His findings were corroborated by the University of Toronto, where similar variations were found in several children's diseases.

The occurrence of certain symptoms associated with a raised alkali reserve was observed in some of Sippy's cases by Hardt and Rivers (1923) who published the first clinical account of uncompensated alkalosis. The clinical picture and the blood chemical findings were fully described by Cooke (1932). Cooke did not report any quantitative urine chemical findings on the cases that he observed. It is the objective of this paper to focus attention on the twenty-four hour urinalyses of sixteen cases of uncompensated alkalosis which we observed during the past two years.

The average value of the qualitative albumin determinations on the sixteen cases showed a reading of one plus. All the cases had a positive benzidine reaction on the filtered specimens. The following are the values of the most striking chemical characteristics of these urinalyses:

	Mean Grams	Average Deviation	Average Normals Grams
Total Creatinine	0.547	± 0.108	1.200
Total Nitrogen	7.375	± 2.500	12.000
Total N. as NH <sub>3</sub>	4.341	± 1.810	1.100
	c.c. N/10 HCl		c.c. N/10 NaOH
Total Alkalinity	1081	± 453	180
Ammonia Coefficient	54.6	± 13	6

We were able to observe four cases, in which, after the alkali medications were discontinued, the patients recovered from the alkalosis and the quantitative chemical urinalyses returned to normal

but there were present evidences of some renal impairment. The average value of the qualitative albumin determinations on these four cases showed a reading of two plus and the benzidine reaction was positive. The urine sediment contained hyaline casts, finely granular casts and erythrocytes.

### Conclusions

1. There is a marked deficiency in the creatinine content of twenty-four hour specimens of urine in cases of alkalosis.
2. There is a decrease in the total nitrogen, an increase in the total nitrogen as ammonia and a marked increase in the ammonia coefficient of urinalyses in uncompensated alkalosis.
3. That after recovering from uncompensated alkalosis there is evidence of renal impairment.

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## HEMOLOGIC OBSERVATIONS ON THE ANEMIAS AND LEUKEMIAS

### IV. SICKLE CELL AND ERYTHROBLASTIC ANEMIAS\*

By E. A. SHARP, M.D. AND E. M. SCHLEICHER, A.B.

Cryptogenetic blood disorders constitute a most interesting class of entities. Among them, erythroblastic anemia and the sickling phenomenon offer the hemopathologist the widest field for study. While the red blood cell patterns of the two anemic states are dissimilar, they can be discussed together since the erythrocytes in both show bizarre defects. Erythropoiesis in erythroblastic anemia and sickle cell anemia, then, is not only quantitatively but qualitatively defective.

#### *Sickle Cell Anemia*

Erythrocytic sickling is a phenomenon that can be demonstrated in the red cells of the bone marrow as well as in those of the peripheral blood stream. The percentage of erythrocytes from either source showing this distortion varies with the technic used for demonstration. It is usual, however, to be able to induce some degree of sickling in as high as 70 per cent of all red cell series whether prepared from bone marrow or peripheral blood.

In a recent study reported elsewhere (1) the sickling trait in cells from the bone marrow and blood stream was studied. After suitable wet preparations were sealed it was found that 60 to 70 per cent of the cells showed sickling within a period of 6 hours when held at room temperature. When the seal was broken and the cells thoroughly washed with 0.85 per cent saline solution, normal cellular morphology was restored. When the same cells were again suspended in the patient's blood serum sickling distortion was again induced.

The sickling trait appears to be an inherent defect of the erythrocytes. It may be latent, only to be induced after the cells are

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subjected to certain conditions. A suspension of erythrocytes in serum, when sealed and held at room temperature will show sickling within six hours if the phenomenon is inherent, while a blood preparation prepared under ordinary conditions usually may fail to show the characteristic. Hahn and Gillespie (2) and others have demonstrated by *in vitro* experiments that a reduction in oxygen tension caused the sickling phenomenon. Scriver and Waugh (3) noted that sickling occurs when the O<sub>2</sub> pressure falls below 45 mm. Hg. These investigators suggest that the sickling *in vivo* may be brought about by conditions of anoxemia. In moist preparation Cooley and Lee (4) found that sickling develops and remains unchanged for as long as two weeks.

Normoblasts are commonly found in the anemic phase of blood showing the sickling phenomenon; they also, sickle in the same manner as the adult erythrocytes. Other distortion of the red blood cells of sickle cell anemia are elliptical, curved, angular, barbed and oval forms. Blood from the spleen and liver, also, show narrow, pointed and rod-shaped cells.

In the latent phase of the anemia when only slight blood depletion is found, the erythrocytes show a diameter within the range of normal. During the anemic stage, when the red blood count may fall below 2.5 million per cubic millimeter the mean diameter of the erythrocytes may be increased. The reticulocytes often are increased, concentrations as high as 25 per cent having been found when the anemia is severe. Megaloblastosis and normoblastosis, also, accompany the lower red blood cell levels in sickle cell anemia and the thrombocytes are found in low normal or decreased number. It is interesting to record, also, that some observers have found the thrombocytes increased in number. The red blood cells of sickle cell anemia show a normal or increased resistance to hypotonic salt solution. There seems to be no disturbance of coagulation or bleeding time.

While the hemoglobin is usually high compared with the red blood cells concentration, particularly when the mean erythrocytic diameter is above normal, the predominant erythrocyte shows varying distribution of pigment. The mean diameter in this form of anemia has been found to be as high as 8.0  $\mu$ . when the red cell count has been as low as 2.0 million per cubic millimeter. It is remarkable, then, that normochromia or slight hyperchromia are the rule even though severe anemia is constant.

The white blood cell pattern in the active phase of sickle cell anemia is variable as in many anemias. In a majority of the cases reported, however, leukocytosis has been accompanied by a variable differential distribution. The total number of leukocytes ranges from the maximal normal of 8,000 to 30,000 per cubic millimeter.

There is a degenerative-regenerative left nuclear shift in the myeloid series associated with a normal number of neutrophils in the latent phase. In the active state a neutropenia and rarely a neutrophilia might be seen since the extent of dysequilibrium between cell production and cell consumption will vary considerably. Lymphocytosis and monocytopenia are fairly constant, the ratio varying from 4 to 1 to as high as 35 to 1. This disturbance in lymphocyte-monocyte ratio has no real significance in sickle cell anemia, however, as far as is known since it is found in other severe hemopoietic disturbances.

Cooley and Lee (4) believe that the presence of sickle cells in the blood does not in itself imply any essential anemia, since sickle cells are common. They assert that "sickle cell anemia" should be reserved for patients showing a definite hemolytic manifestation.

#### *Erythroblastic Anemia*

Another hemopoietic phenomenon of unusual pattern has been classified under the disorders of the blood of cryptogenetic origin. This condition is characterized principally by the large number of immature red blood cells found constantly in the hemogram. Furthermore, there is a constant leukocytosis.

The essentials of the red blood pattern are both qualitative as well as quantitative changes. Erythrocytopenia is severe, frequently as low as 1.0 million per cubic millimeter; the mean diameter of the erythrocytes may be normocytic or slightly above normal. Marked anisocytosis, poikilocytosis, ovalocytosis and polychromasia are found during the severe anemia phases along with stippled erythrocytes. What appears to be defective stroma is seen frequently in the erythrocytes, giving a very irregular staining reaction.

Megaloblastosis has been found in a percentage of 8 per hundred leukocytes during severe relapse of erythroblastic anemia. Normoblastosis occurs to a greater extent, however, this nucleated form having been observed in a ratio of one for every 3 or 4 leukocytes. Microblasts are almost a constant feature of the red blood pattern, also, during severe anemia. Reticulocytes displaying heavily wreathed forms often constitutes 8 to 15 per cent of the red blood cell elements, while the platelets are reduced to a low normal or are definitely below normal. The thrombocytes are poorly structured, anisocytotic, and many are fragmented.

The constancy of leukocytosis has been remarked above. Concentrations of 20,000 to 30,000 per cubic millimeter are frequent. The neutrophilic series is normal in percentage but there is generally an extreme left regenerative myeloid shift—myelocytes have been observed to constitute 5 per cent of the total neutrophil series along

with metamyelocytes and a large number of stab forms. Myeloblasts are seen occasionally, also, showing mitotic figures.

The lymphoid series of leukocytes quantitatively is within normal limits. Qualitatively they show no particular deviation from normal, being largely of the small, adult type.

Bleeding time is variable but has been found prolonged in one instance as long as 18 minutes. The coagulation time is usually normal.

Since the spleen is enlarged in erythroblastic anemia its cellular constituents are of some interest. It is generally conceded that erythroblasts would predominate in the splenic tissue and this would seem to be supported by observations made on spleen substance removed during life by puncture. Figure 3 shows an erythroblastic nest from a female patient nine years of age during a severe phase of anemia of this type.

Anemias of the cryptogenetic type have been given considerable attention in recent years. Even though the mechanism of the hemopoiesis is not fully understood it can be said, on the basis of present concepts, that the primary disturbance in the two forms discussed above is one of defective blood formation. On the other hand abnormal blood destruction operates in both conditions; hence, the dictum of Cooley and Lee (4) cited above must be regarded as explaining the frequent severe relapses.

In all anemic states an imbalance between cell production and cell consumption must be admitted. But the perplexing issue is whether inherently defective erythropoiesis in both entities covered in this report so conditions the red blood cells as to impair their viability or are there forces operating in these anemic subjects which accelerate blood destruction, thereby reducing materially the chance of normal erythropoiesis.

### *Summary*

1. Sickle cell anemia and erythroblastic anemia are cryptogenetic in origin.
2. The sickling trait is developed by subjecting the erythrocytes to certain *in vitro* conditions at room temperature.
3. Normal contour of sickle cells can be restored by washing

## HEMOGRAM IN COLOR

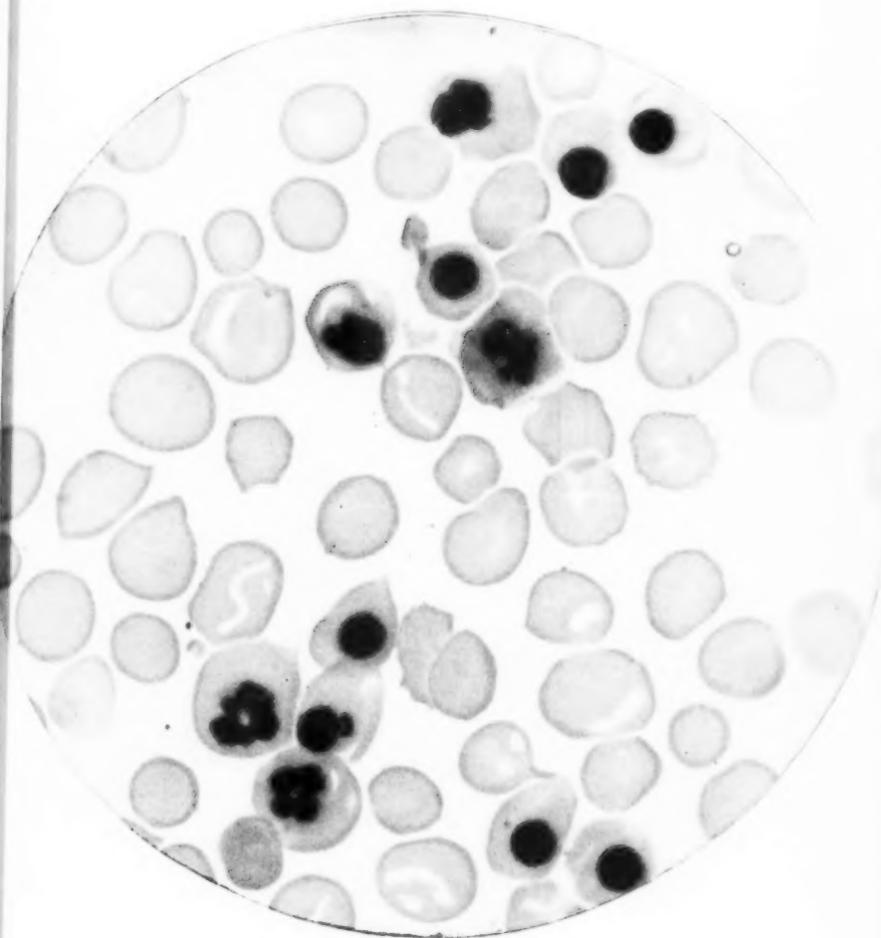


FIGURE 1

Erythroblastic anemia of Cooley and Lee

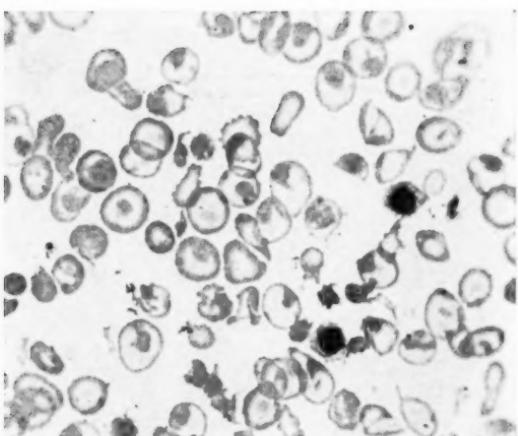


FIGURE 2

Erythroblastic anemia in an adult showing defects in erythrocytic stroma and other characteristic changes in morphology.

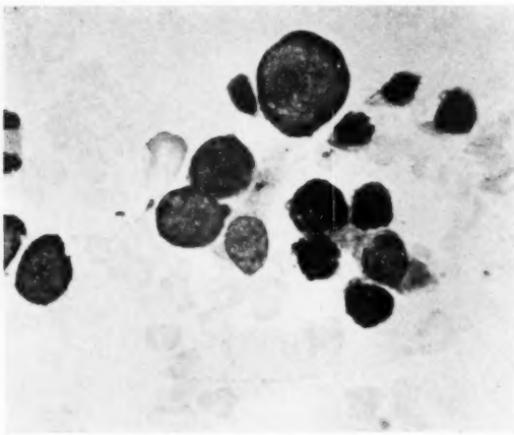


FIGURE 3

Erythroblastic "nest" from spleen.

in 0.85 per cent saline solution and reinduced when returned to blood serum from the patient.

4. Sickle-cell formation can be induced by decreased oxygen tension.

5. Erythroblastic anemia is characterized by a persistently immature red blood cell pattern, defective erythrocytic morphology and leukocytosis.

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*Erratum*—In the hemograph appearing in the American Journal of Technology, 3:16-22 (January), 1937, the figure at the top of those listed under Hb. should read 60 and not 30.

## NOTES ON PARAFFIN TISSUE EMBEDDING

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Those who are doing a large volume of paraffin section tissue work, no doubt, are fully aware of the amount of time that is spent in the preparation of suitable block containers for embedding.

Several methods of forming these blocks are employed. The metal L's and copper plates are suitable when only a few must be molded. Boats made of heavy glazed paper are very satisfactory, if properly made to insure leakage, but much valuable time is consumed in the construction of these boats.

We have found the use of one-ounce Dixie Cups (Individual Drinking Cup Company) to be the most satisfactory for the purpose of embedding. These cups are very reasonable in price, are clean and ready for immediate use. They are dispensed in lots of one hundred.

## TECHNICIANS AND LABORATORY RELATIONS\*

By RALPH EMERSON DUNCAN, M.D.

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I'm very glad to have this opportunity to meet with you, and if we can dispose of the idea at the start that I am here in the attitude of a fault-finder or even an instructor, I think we can utilize the few minutes that we have together to make our conference pleasant and profitable to everyone of us. It will be more of a social chat, after all, or at least let us consider that suggestion as a sugar coating to whatever little pills of information and advice I may see fit to deliver in the next few minutes.

Let me say at the outset, so I may establish some qualifications that may account for my being here today upon this platform, that it has been my pleasure to work in the practice of medicine for the past 20 years. Fifteen of these years have been spent in laboratory work. The fields of my studies and experience have been in the home, the hospital, the factory, the mines, in my own laboratories, those of municipal hospitals, in the navy and in medical schools. This experience has brought me into contact with many problems dealing with doctors, patients and technicians, viewed from the standpoint especially of laboratory efficiency and pathological experience. In this way and from this field of experience, I have accumulated a great many observations in the operation of hospitals and laboratories, and in dealing with physicians and patients, that do not come often under the supervision of the ordinary practitioner.

I think I can assume to know something about how a laboratory should be run in order to produce the greatest benefits to doctors and patients, as well as to contribute to the creditable reputation of the pathologist or technician in charge. This morning I want to talk to you in as familiar a way as I can command and as informatively as I may, and at the same time as kindly and as courteously as our relationships should demand, about some of the things that I feel you, as technicians, should know—and some of which I am sure you do know—if you are to make the greatest headway as individuals and the greatest success in your chosen vocation.

\* Read before the Fourth Annual Convention, A. S. C. L. T., May 11-13, 1936.

*Some Shortcomings of Technicians*

I have sketched over in my mind several topics that embrace many of the short-comings that have come under my notice among technicians in my laboratory work. I say short-comings, not in a critical sense, because I am aware that many of the lapses from the required routine of the laboratory and the strict devotion to certain rules that must govern its successful operation are very often the results of thoughtlessness. And, here I may lay down one fundamental principle which I think will serve as a foundation for the few suggestions that I am about to make, and that is—that a laboratory is no place for an absent-minded person.

The very nature of your occupation, like that of the pathologist himself and the practicing physician as well, calls for the closest application to any problem presented, a knowledge of its details and meticulous concentration upon working your tests out to a mathematical certainty. I am sure that this foundation stone of the technician's vocation is one that you all realize the importance of. The Bible tells us, "By their fruits, ye shall know them," and in the end—the ability and the efficiency of a technician are to be determined by the accuracy and care with which she performs the tasks assigned to her. It is the truth that you will learn by experience, if you have not already learned it, that you will be judged more often by your errors than by the many things that you do well.

This probably is all I need to say about what might be called the scientific details of your work. But a technician is called upon to recognize many more duties than those that appertain to her work in following out the tests which she is called upon to make from a scientific standpoint. There are social obligations within the walls of a laboratory which are of as great importance sometimes as the merely technical duties of the technician. She must contribute, in many ways, to the social atmosphere (good feeling) of the laboratory.

In a way, the technician, in her relations to the patients is invested with many of the social duties of a host. In meeting patients, it goes without saying, she should be always courteous and pleasant, but this pleasantness should never border upon familiarity. A certain dignity must always be preserved in your dealings with the referring doctor. This does not necessarily mean that you must present a frozen face to his occasional jocularity, but that you should always remember to preserve your own dignity and protect both that of the doctor and your laboratory. With the patient himself or herself, there is great danger in permitting your intercourse to become too familiar, as this attitude may often impress the pa-

tient with a doubt that he is about to receive that careful consideration of his ills and that scrupulous conduct of the necessary tests prescribed by his doctor which every patient feels that he is entitled to.

### *The Sympathetic Touch*

A smiling face, a pleasant manner, a gentle touch and a kindly and sympathetic look from the eyes are all valuable assets to a technician in meeting suffering people who are thinking of their own ills, which are at the moment probably the most important things in life for them. Upon this topic of the social atmosphere, I think it is well to warn you about visitors, or, what I may call without offense, laboratory loafers, that very often drop in merely to chat and perhaps in pure friendliness overstay their time or indulge in irrelevant conservations that may seriously interfere with the technician's work, or at least, with the technician's ability to concentrate wholly upon that work. These laboratory triflers, often good friends, and sometimes not so good, can easily be disposed of without giving offense. This should be done in the spirit of a host. Gently ease such intruders toward the door and smilingly bid them Godspeed, giving them tacitly to understand that you have work in hand.

These suggestions also go to the relationship of technicians among themselves where several are employed. Avoid close friends in work. Do your own work, help others willingly when necessary, but do not volunteer uncalled for help. I am no hard task-master. I have found that the technicians employed in my office get along among themselves better and have a more friendly feeling perhaps towards me if they are allowed certain liberties, which in no way interfere with their work. I'm rather partial to a person of neat appearance in the office, and I'm never averse even to considering a proposition of a visit to the hair-dresser or dressmaker when necessary. Even during working hours.

### *Impressing the Patient*

I need scarcely remind you, I believe, of the necessity of exercising gentleness and care in the handling of patients that visit your doctor's office or the laboratories in which you may be employed. Much depends on first impressions. This rule should especially be observed in dealing with refractory, stubborn or antagonistic patients. Let the patient lose his temper, that is his privilege as a patient and as a man suffering from some complaint. They are not always in the best of humor, but the technician should never lose her temper, her presence of mind or her gentleness in dealing with the patients, especially on a first visit.

It is well always to bear in mind that a sick or ailing person is naturally supersensitive. His temperament is like a highly sensitized photographic plate that registers and keeps the slightest sensations. Some little fault, some impatient mood, some neglectful remark might put the idea in his head, which he would carry back to the referring doctor, that the laboratory was not duly considerate and that he would not receive the proper attention there. Make your patient feel at ease on first acquaintance and maintain that attitude throughout your dealings with him. You will find that such an attitude will contribute, not only to your own efficiency as a technician in your work, but also will redound to the credit of your employer, whether doctor or pathologist, or hospital. If the patient's trust in the operative technician fails, it may react in failure to trust both in the pathologist and the referring doctor.

It is important that the technician impress patrons with her knowledge and ability to perform the duties entrusted to her. Doubt is always disturbing. Hesitancy and fumbling, in method or apparatus, are prime motivations for such doubts. An impression of promptness and sureness can easily be conveyed to the patient by the tactful technician. But, in this connection, let me warn you against "show-off" tactics. Avoid display in your work. Do not let the patient or the doctor get the idea that you are trying to show him how efficient you are, or that you are seeking unduly to impress him with the importance of your work. Some technicians that I have encountered in my experience, have these faults. They may be highly capable, both in knowledge and experience, but this very capability and confidence in their skill sometimes leads them to over-play their part. Excellent things in the laboratory are poise, self-control and conservatism of method.

#### *Keeping Your House Clean*

A good technician must be a good housekeeper. Now, I do not mean to imply by that bald statement that she has to sweep the floor or beat the rugs, or dust the shelves or the books as she might in her own home. I mean that she must do her part to preserve an atmosphere of absolute cleanliness in the laboratory, which is her working home. If you should happen to be walking along a public street, you will often find yourself unconsciously stopping in front of some neatly decorated show window, your attention is involuntarily attracted. Everything is neat and in its place, and arranged to convey a sense of beauty and aesthetic fitness. The visitor to a laboratory should be confronted with just such conditions when he steps across its threshold. A spirit of cleanliness must be apparent. There must be no suggestion of slovenliness or neglect in the care of instruments

or in the distribution of stains, reagents or solutions upon the shelves, or in any of the paraphernalia with which a laboratory does its work. This cleanliness must also be insisted upon with reference to the uniforms and the wearing apparel of the technicians themselves. A neat laboratory conducted by neat technicians is an initial bid for confidence.

### *Accuracy*

There is one word in the vocabulary of a technician's trade that I want to impress upon your minds, if it is not already impressed there, as an essential quality that underlies every detail of your labors. That is the word "accuracy." This applies to tests and the records that you keep of tests. The technician must always bear in mind that she, personally, is a trustee of the doctor and the employing pathologist's confidante. A test that is not absolutely accurate is no test. A slip in one minute detail or another in the progress of working out your problem may lead to a result that would be damaging all around. Of course, it might seem that this caution is needless. For the very purpose of a laboratory test is to enable the diagnostician to determine the nature of the disease and the method of treatment indicated.

In this regard you will readily see that a delicate and vital responsibility rests upon the technician entrusted with the performance of the tests indicated. A careless technician will soon find her occupation gone. This care and attention to accuracy should be advanced into the records kept with the same accuracy as that given to the performance of the tests. The records themselves should be kept neat, clean, clear and removed of all possibility of doubt or mistake. I hardly think it necessary to dwell long upon this feature of your work. Accuracy is the *sine qua non* of the technician's profession. There was a celebrated French orator during the Revolution in France who adopted as his motto three words, "Audacity, Audacity and still more Audacity," although he spoke the words in French. In like manner I believe that the technician who aims at perfect success in her work might easily follow the example of that great statesman and orator by adopting as a paraphrase for her motto, "Accuracy, Accuracy, and still more Accuracy."

### *The Diplomatic Manner*

And now, I want to refer to a topic which at first blush, you might think would refer more to political life than to work in a laboratory. I mean the necessity of diplomacy in relation to your

contacts with patients and doctors, and more especially with relation to the patrons that visit the office for treatment. You will find, and no doubt in your experience you have found, that patients are very curious and eager to find out things for themselves, irrespective of the referring doctor. They often try in many ways to become confidential with the technician with a view of finding out things about themselves and their condition, and to obtain information that the doctors perhaps have not felt it wise to impart to them. This is one field where you will often have to invoke the aid of diplomacy. Perhaps a better word would be tact. The patient must be encouraged to impose confidence in you, but at the same time, that encouragement should not pass beyond bounds of professional dignity or encroach upon the province of the physician himself.

The technician should know, and must learn, just how to impart certain information to the patient and withhold other information which her common sense and professional experience should tell her must not be imparted to the patient. This does require a diplomatic use of language and a tactful manner of handling the patient. It is a test and rather an important test of the temperament of the technician. In this connection, the technician perhaps may often find a conflict arising with her own personal egotism. I would not value very highly a technician who did not possess egotism, a high faith in herself and her own ability and confidence in her knowledge, but herein lie pitfalls for the technician. Personal egotism is a colt hard to break to the harness. And yet, it must be broken. Pride in her ability she must possess in order to insure efficiency in her work. Pride is a good incentive. But let her remember—to quote Scripture again—"That pride goeth before a fall." And, many a technician has had a fall by reason of this very fine quality called "pride" or egotism, if you will. It has a tendency to lead her to draw undue inferences from certain features of her tests.

#### *Caution in Language Before Patients*

The technician should always remember that her work is to establish facts. The inferences are to be drawn by the referring doctor or perhaps the employing pathologist in co-operation with the doctor. This diplomatic thoughtfulness should keep her warned of chance expressions in the presence of her patients. Quite often it may have occurred to you in taking cardiograph tracings that some result obtained would be of such an extraordinary nature that an exclamation of surprise might involuntarily escape from your lips, forgetful of the fact that the patient's eager eyes are fixed upon you, and, if possible, upon the graph. It would be well if the

technician could emulate the inscrutable smile of a Mona Lisa which might mean much or nothing, but at least keep the patient assured that nothing very unusual was happening in his case. The serenity of a nun might be a valuable acquisition, and I might say that I have found in technicians among this religious order, the very highest form of hospital diplomacy. Of course, judging from the smiling and hopeful personalities that I find myself confronted with today, I would not prophesy that such a vocation or such a blessing, if you will, lies in futurity for any more of you. But it would not be amiss to emulate the tact and the singleness of purpose that is symbolized in the countenance of the nun.

In conclusion, allow me to elaborate a little, based upon my experience, both as a doctor and pathologist, upon the peculiar relationship that establishes the co-operation between the referring doctor, the pathologist and the technician with direct reference to the reputation and credit of the laboratory in which you are engaged. Let me say in this connection, and I want to impress this fact deeply upon your minds, that while there is a triple relationship between doctor, pathologist and technician of a very confidential character, there is an especial dual relation that is related especially to the technician herself. The technician acts both as a private secretary and somewhat in the capacity of a nurse to both the doctor and the pathologist. She is entrusted with the official secrets of both. And, she must strike a nice balance between the two in her duties and obligations to each of them.

#### *Wisdom in Forethought*

I have used the term "nurse" in this connection. I have in mind that primal duty of preparedness that attaches to the technician in the hour of tests. Let me illustrate by analogy. When a doctor is performing a surgical operation, the nurse stands by his side with all the appurtenances of that operation at her hand ready when the sign or the call comes from the doctor. Upon her preparedness often depends the success of the operation. This same attitude of preparedness, the technician must possess and exercise. When the patient comes to the laboratory to undergo the tests indicated by the referring doctor, there must be no fumbling with the necessary apparatus. Like the nurse with the surgical operator, she must have everything ready and near at hand. If, for instance, it is a blood transfusion, there must be no hunting around for the necessary instruments. In heart tests, she must know that the cardiograph is in operation faultlessly. In this connection, I wish to recall an incident that was related to me by a patient, a friend of mine. It will bear upon the relationship of the technician to the pathologist,

especially. The technician in this case was a very efficient one. One of the best that I had employed in my work. But when the patient was taken into the examining room for the cardiograph test, I, myself, undertook to regulate the machine and unconsciously turned the wrong gadget. The technician, without thinking, spoke up and said, "No, that is not the way, Doctor." She, then, did it correctly. She had no idea that the patient noted the fact that the pathologist had made a mistake in regulating the machine, but months afterwards when I visited him at his home, he related the incident to me. It was the technician's duty to the pathologist, as his private and confidential operator, to say nothing within the hearing of the patient, but unobtrusively to correct his mistake.

#### *The Technician's Dual Loyalties*

I have said that the technician is in the nature of a private secretary to the referring doctor as well as to the pathologist who employs her. And here, I feel that a word of caution is very necessary. It very often happens that when a doctor undertakes to diagnose a case in his office by superficial symptoms, it is difficult for him naturally to reach definite conclusions as to what exactly is the nature of the patient's complaint or illness. Lawyers in preparing for cases sometimes go on what they call "fishing expeditions" which means that they will take depositions and examine various witnesses in their offices for determining their future course of action, with regard to the case in hand. The same method is often employed necessarily by the referring doctor. He may order a variety of tests to be made by the pathologist. The technician familiar with these various tests may understand that they are not correlated or, in her opinion, seemingly not necessary in a particular case. Here, then, comes sharply up for consideration, the confidential relation that exists between the technician and the referring doctor. She has not only the credit of her employing pathologist to guard, but also that of the doctor with whom he is co-operating. Whatever her doubts may be, or her convictions, arising from her experience in the laboratories, as to the necessity of various tests, her duty is a simple one—to see that every test is carried out without comment, without any attitude of doubt, in full and complete co-operation with the doctor's demands. This suggestion trenches closely upon the faults that arise from a pride in knowledge and her superior experience in making the tests prescribed. She has no business to draw her own conclusions. As unrelated as the tests may appear to her to be, she should realize the fact that the doctor is groping for a clue and searching out every possible avenue in the human organs that may lead him to the root of the trouble with which he has to deal.

And now let me express the hope that these suggestions which I have made will be accepted by each of you in the friendliest and most sympathetic understanding. I did not come here to be unduly critical, to harp upon your faults, or to call attention especially to the shortcomings of any one of you. I realize that each of you have made a study of the vocation you have undertaken with the high aim in view of becoming efficient in your profession, of achieving success, of lending a hand in the important service that you have undertaken, to furthering the cause of medicine and the healing art to which you have dedicated yourself. I believe in your spirit, your ambition, your honesty and your loyalty, and I am hopeful and confident that the few things that we have talked about today will plant suggestions in your mind that will be a benefit to you, to your employer, to the doctors with whom you have to deal, and to the patients that come to you with trust and confidence in your ability to contribute your share towards the objective of restoring them to normal health.

## **EDITORIAL**

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### **THE ATLANTIC CITY CONVENTION**

To those who were able to attend one of the former conventions held in Atlantic City, the attractions need not be mentioned. To those who did not attend and have not been to Atlantic City, a brief mention should be made.

Atlantic City, in reality the Nation's seaside summer resort, a city, the location of which is unique and whose approaches by highway and rail traverse routes of noted scenic beauty. The majestic grandeur of the ocean stretches outward beyond reach of the eye and the beach is a scene likely not to be soon forgotten.

The committee in charge has arranged for a very instructive program for this session. Among those presenting papers are Dr. Arthur F. Coca, editor of the Journal of Immunology, Dr. Edwin E. Osgood, author, and Alice C. Evans, National Institute of Health, all of whom need no introduction. An entire afternoon will be spent at the exhibits of the American Medical Association which will prove very profitable. A definite program has been prepared for the social activities which includes among other things, a twilight sailing party.

This is an ideal opportunity to couple vacation holidays with a convention of real value. Plan now and set aside June 7-8-9 to attend. You will meet many fellow members, take part in directing the business of the organization and enjoy an instructive program.

## NEWS AND ANNOUNCEMENTS

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### REGISTRY OF MEDICAL TECHNOLOGISTS OF THE AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS

As this issue of the "Journal" is going to press the Registry office is preparing for the spring semi-annual examination. Four hundred and sixty-five applicants are scheduled to present themselves before one hundred and fourteen examiners, throughout the United States and Canada.

The Registry is now conducting an intensive campaign to combat the wave of state licensure of Medical Technologists which seems to be sweeping several of the states. The American Society of Clinical Pathologists, the Board of Registry, and the American Medical Association are decidedly against such a procedure for the reasons enumerated in the advertisement of the Registry appearing on the inside back cover of this "Journal." It is therefore suggested that all registered M.T.'s inform their fellow workers through local and state societies and individually of the attitude of the Registry to this useless and superfluous legislation. If possible, steps might be taken to contact your state representatives where such legislation has been introduced, encouraging them not to lend countenance to such endeavors as inimical to the interests of the Medical Technologists as well as to the patient and the public.

#### NATIONAL

*To the Members of the American Society of Medical Technologists*  
Greetings:

As the time draws near, for the fifth Annual Convention of the A. S. M. T., I wish to take this opportunity of sending a word of welcome to all of you.

Here is an opportunity to hear eminent speakers, on current laboratory problems, to see and hear what other Technologists are doing, to see exhibited the latest methods and the latest equipment for laboratory use. Here is an opportunity to make new friends and renew old acquaintances, in an atmosphere delightfully suited to revive the enthusiasm we all need to give the best to our profession.

Do not let this opportunity pass. Make every effort to enjoy with us the delightful program and entertainment features which are to be offered.

And to those members who have worked through the year for the good of the Society and for the success of the coming convention, allow me to express here my deep appreciation and thanks. The loyalty and co-operation you have shown and the time and energy you have expended, will be rewarded in the benefits we shall all receive, directly and indirectly, through your labor.

F. H. Claussen, President.

Announcement has been made of the appointment of the following committees for the June meeting:

*Nominating Committee*—M. Effinger, M.T., Chairman; G. Eckfelt, M.T., M. Baker, M.T., B. Elliott, M.T., and L. Ray, M.T.

*Committee on Awards*—J. J. Moore, M.D., Asher Yaguda, M.D., and Sister M. Joan of Arc, R.S.M., M.T.

The Committee on Sisters' Reservations and Entertainment wish to announce that a circular and questionnaire card, under separate cover, has been mailed to each registered Sister Medical Technologist giving sufficient details to enable her to see the ease with which she might travel to and profit by the Annual Convention of our Society in Atlantic City, June 7, 8 and 9. To enable the committee members to handle the necessary correspondence in due time, we ask each Sister planning to attend the convention to return the questionnaire card as soon as possible.

Questions concerning a detailed itinerary for any Sister interested should be addressed to the Sister committee member assigned to the state in which the inquirer resides.

Sister M. Alcuin, O.S.B., Chairman, St. Mary's Hospital, Duluth, Minnesota, responsible for—Connecticut, Idaho, Iowa, Maine, Massachusetts, Minnesota, Montana, New Hampshire, North Dakota, Pennsylvania, Rhode Island, South Dakota, Vermont, Washington, Wisconsin, Wyoming, British Columbia, Alberta, Manitoba and Saskatchewan.

Sister M. Gonzaga, R.S.M., St. Joseph's Mercy Hospital, Detroit, Michigan, responsible for—Arkansas, Delaware, Illinois, Kansas, Michigan, Missouri, Nevada, New Jersey, North Carolina, Oklahoma, Oregon, South Carolina, Washington, District of Columbia, West Virginia, Ontario and Quebec.

Sister M. Inez, R.S.M., Mercy Hospital, Canton, Ohio, responsible for—Alabama, Arizona, California, Colorado, Florida, Georgia, Indiana, Kentucky, Louisiana, Maryland, Mississippi, Nebraska, New Mexico, New York, Ohio, Tennessee, Texas, Virginia, Utah, New Brunswick, Prince Edward Island, Nova Scotia.

Reservations are being made for the Sisters at the Knights of Columbus Hotel, which hotel has been highly recommended by the Catholic priests of Atlantic City and former Sister patrons of the institution. Please write to Knights of Columbus Hotel, Atlantic City, N. J., and make your reservations directly. Where specifically requested reservations can be obtained elsewhere.

#### STATE

##### *Arkansas*

Dr. R. R. Kracke was honor guest at the monthly meeting of the Arkansas Society of Medical Technologists in Little Rock, Wednesday, April 14. He spoke on the importance of registration, outlining the work done by the Registry of Technologists, as well as plans for the future.

##### *Illinois*

The Chicago Society of Medical Technologists met at St. Vincent's Hospital on March 18, 1937, to discuss the timely subject of "Syphilis." Dr. Bertha M. Schafer, representative of the Chicago Board of Health, outlined the history of the fight against Syphilis and also the present program of Chicago towards venereal diseases. Dr. Mabel M. Matthies presented historical as well as technical facts concerning the complement fixation reaction.

##### *Minnesota*

The Gopher State is proud to boast of the President of the American Society of Medical Technologists as one of its daughters. Frieda H. Claussen is a resident of St. Paul, Minnesota, an employee of the Charles T. Miller Hospital and the fifth national president of our society.

Miss Claussen is a graduate of Smith College, Northampton, Massachusetts, receiving her Bachelor of Arts degree with double distinctions, cum laude, and the additional phrase: "Honors in chemistry." At the time of her graduation from college in 1920 there were no schools or courses for medical technologists as such so Miss Claussen attended the University of Minnesota Medical School, taking summer courses in Clinical Microscopy, Blood Chemistry and Metabolism.

In December, 1920, the Miller Hospital opened its doors and two technologists collaborated in discharging the clinical laboratory duties of the hospital, Miss Claussen being one of them. She has remained with the Miller Hospital ever since and is at present general supervisor of the laboratory and assists in the direction of the school of medical technologists connected with the hospital.

A double urge made Minnesota Medical Technologists think of organizing the state. Firstly, when whispers from the Excelsior Springs convention floor reached Minnesota winds that the National organization was going to work out as its big problem for 1936-1937, the chartering of the states.

Secondly—Traditional to Minnesota Hospital Association is the practice of taking to convention with it the allied organizations that function in the care of the sick. Prior to 1937 anesthetists, dieticians, social medical workers, record librarians, occupational therapists, physical therapists and superintendents of nursing schools convened with the hospital association. This year an invitation came to the medical technologists to do the same.

In St. Paul and Minneapolis there has existed a society of medical technologists which has functioned for years. Duluth and vicinity also have a society of medical technologists; later it was learned that in northern Minnesota, Crookston boasted of a local society of Medical Technologists. In taking the census of all these it was found that only the Duluth society had the distinction of being composed of all registered members and so to it went the invitation from the National President—F. H. Claussen—to become the nucleus of the state organization. In its annual election, choice of president of the Duluth Society fell upon Sr. M. Alcuin, O.S.B. Simultaneously with this official capacity went the temporary chairmanship of the state organization.

The earnest efforts to organize did not succeed and the state is about to go into convention. However, the work stirred up so much interest in medical technology, that the famous medical center—Rochester, Minnesota, became interested and the 92 technologists there employed just recently formed a local medical technology society, this is the fourth and last local society in Minnesota.

The Minnesota Hospital Association convenes in Rochester, May 13, 14, 15, 1937, taking into convention with it eight allied organizations. The program reserves one-half day for each organization for a sectional meeting specific to itself. The Medical Technologists are introducing the scientific program with a luncheon-business meeting at which time the state will be organized temporarily. On the scientific program will appear Dr. W. A. O'Brien of Minneapolis and Dr. Kano Ikeda of St. Paul; Dr. T. B. Magath, Dr. A. H. Sanford, and Dr. Frank J. Heck of Rochester. Two sight-seeing trips are being planned—one through the famous Mayo clinic and the other to the Institute of Experimental Medicine directed by Dr. Feldman.

## **ABSTRACTS**

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**EFFECT OF THYROIDECTOMY ON BLOOD LIPIDES:** Eldon M. Boyd. *Trans. Roy. Soc. Can.* 30, V, p. 11-17, 1936.

The plasma lipides are increased following subtotal thyroidectomy but the lipides of the red blood cells do not show any change.

**NOTE ON TURBIDITY IN URIC ACID DETERMINATIONS WITH SPECIAL REFERENCE TO THE PHOTO-ELECTRIC COLORIMETER:** I. M. Diller. *Jour. Biol. Chem.*, March, 1937, p. 161.

The author discusses factors which cause turbidity in blood and urine uric acid determinations and discusses their prevention.

**THE CONCENTRATION OF TOTAL CHOLESTEROL IN THE BLOOD SERUM:** W. M. Sperry. *Jour. Biol. Chem.*, Vol. 117, 1937, p. 391-5.

Work on 25 healthy adults showed that there is very little variation in the cholesterol content of any one individual's serum over long periods of time.

**THE BLOOD SUGAR IN CONVULSIONS OF INFANCY AND CHILDHOOD:** Margaret Maclean. *Arch. Dis. Childhood*, Vol. II, 247-56 (1937).

Blood sugar determinations on children proved to be higher during or immediately after convulsions. This was followed by a drop below the normal and a subsequent gradual rise to normal. Return to normal may be facilitated by administration of adrenaline. The phenomenon is thought to be the result rather than the cause of the convulsions except in very rare instances.

**THE ISOLATION AND TYPING OF C. Diphtheriae ON TELLURITE BLOOD AGAR:** V. Glass. *Jour. Path. and Bact.*, Jan., 1937, p. 235.

The author's method for readily recognizing colonies of diphtheria bacilli on culture media is based on the blackish color produced in them by the reduction of tellurium salts and the inhibitory effect of tellurium salts on other organisms. Potassium tellurite was added to the medium in varying concentration and approximately 0.04% was found most effective. Rabbit and sheep blood gave better results than that of the horse. Heated blood agar and tellurite medium tends to inhibit some strains of diphtheria bacilli.

**EFFECTS OF BLEEDINGS ON BLOOD OF UNIVERSAL DONORS:** L. Merklen, L. Israel and A. Apffel. *Presse médicale*, Nov. 28, 1936, p. 1941.

The authors studied twenty donors who had given from 2 to 15 liters of blood each. Ten showed more or less neutrophilia, marked in three instances. This tendency to agranulocytosis was the chief important finding. Regeneration after transfusion is fastest in erythrocytes, slightly less rapid in the hemoglobin and still slower in the leucocytes.

**PECULIAR GRANULES IN CELLS OF LIVER AND ADRENAL IN INFECTIONS:** F. L. Santee. *Johns Hopkins Hospital Bulletin*, Dec., 1936, p. 427.

Oval, rod-shaped or club-shaped granules, dark with hematoxylin, appear in cytoplasm. They stain red with pyronin. Little or no mention of these granules has been made in the literature.

**SIMPLE DEMONSTRATION OF LACTIC ACID IN GASTRIC CONTENTS:** H. E. Never and E. Vincke. *Klinische Wochenschrift*, Dec. 26, 1936, p. 1910.

The authors demonstrated that Uffelmann's reaction is not a specific test for lactic acid. Denigès' color reaction is specific. Gastric contents are acidified with tenth normal HCl if not already acid, 5 to 10 c.c. boiled, then filtrated. Filtrate is made alkaline with 10% NaCO<sub>3</sub>. Five drops of tenth normal KMnO<sub>4</sub> is added for each c.c. of filtrate. Bring mixture to boil until the forming manganese dioxide has completely precipitated. After filtration, 2 c.c. of conc. sulfuric acid is added to 0.2 c.c. of filtrate. Heat 2 min. in boiling water bath, cool, add 2 or 3 drops of 5% alcoholic sol. of guaiacol. Lactic acid is indicated by a rose to carmine red coloration. Authors found lactic acid reaction positive in patients with gastric carcinoma.

**AN IRON-HEMATOXYLIN-ANILIN-BLUE-STAINING METHOD FOR ROUTINE LABORATORY USE.** Koneff, A.: *Anat. Rec.* 66:173 (Sept. 25) 1936.

Most of the methods for differential staining of normal and pathological tissues are time consuming and difficult, especially for novices; furthermore they frequently require several staining solutions. The iron-hematoxylin-anilin-blue technique described makes it possible to demonstrate most types of tissue simultaneously and with sufficient differentiation to form a judgment of the total histological make-up of the organ.

**AMERICAN SOCIETY OF MEDICAL  
TECHNOLOGISTS**

*Program of the Fifth Annual  
Convention*



**Headquarters  
PRESIDENT HOTEL  
Atlantic City, N. J.**

**JUNE 7-8-9  
1937**

**General Chairman Program Committee  
LUELLA GIFFORD, M.T., Norfolk, Va.**

*Chair. Scientific Exhibits* ..... P. C. BROWN, M.T., Newark, N. J.  
*Chair. Enter. Comm.* ..... D. ZOLL, M.T., Philadelphia, Pa.  
*Chair. Sisters Reservation and Entertainment Committee* .....  
SISTER M. ALCUIN, M.T., Duluth, Minn.  
*Chair. Local Arrangements* ..... J. NAAME, M.T., Atlantic City, N. J.  
*Chair. Recep. and Regis.* ..... M. GIANNINY, M.T., Lansdowne, Pa.

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**SOCIAL ACTIVITIES**

Convention of the A.S.M.T. at Atlantic City, N. J.  
June 7, 8, 9, 1937

**SUNDAY EVENING, JUNE 6TH**  
Informal Reception to greet the guests.\* 7:30  
P. M.—8:30 P. M.

**MONDAY EVENING, JUNE 7TH**  
"Registry Night"\*\*—Brief talks from mem-  
bers of the Board of Registry of the A. S.  
C. P. 8:00 P. M.

**TUESDAY EVENING, JUNE 8TH**  
Sailing Party—5:30 P. M. followed by a  
Beach Party at 7:30 P. M.

**WEDNESDAY EVENING, JUNE 9TH**  
Fifth Annual Banquet\*—7:30 P. M.

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\* Announcement of place to be made—watch Bulle-  
tin Board in main foyer of the President Hotel.

# AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

## FIFTH ANNUAL CONVENTION

Headquarters, The President Hotel, (on the Board Walk) Atlantic City, N. J.

June 7, 8, and 9, 1937

REGISTRATION : June 7, 8 A. M. to 12 M.

EXHIBITS : Open 12 M. to 2 P. M.—4 P. M. to 9 P. M. Daily.

### MONDAY, JUNE 7, 9:00 A. M.

EXECUTIVE SESSION

INVOCATION

MINUTES OF 1936 CONVENTION

APPOINTMENT OF COMMITTEES

ANNOUNCEMENTS

PRESIDENT'S MESSAGE—Frieda H. Claussen, St. Paul, Minn.

REPORTS :

*Executive Committee* — Frieda Ward,  
Chairman

*Research Committee* — Phyllis Stanley,  
Chairman

*Publication*—John H. Conlin

*Membership*—John H. Conlin

*Advisory Board*—Harry Macko, Chairman

*Counsellors*—Harry Macko, Chairman

*Treasurer*—Christine Seguin

ADOPTION OF REPORTS

NEW BUSINESS

**MONDAY, JUNE 7, 2:00 P. M.**

*Presiding—HERMINE TATE*

1. "The Selection of Donors for Blood Transfusion, with Special Reference to the Preliminary Blood Tests and the Use of the Universal Donor." DR. ARTHUR F. COCA, Editor "The Journal of Immunology," Pearl River, N. Y.
2. "The Diagnosis of Venereal Lesions." DR. EMMERICH VON HAAM, Louisiana State University, New Orleans, La.
3. "Observations on the Opsono Cytophagic Test in Brucellosis." ALICE C. EVANS, National Institute of Health, Washington, D. C.
4. "Easy Approaches to Determinative Bacteriology." ANNETTE M. CALLAN, Philadelphia, Pa.

**MONDAY EVENING, JUNE 7, 8:00 P. M.**

"REGISTRY NIGHT"

*(See social activities)*

**TUESDAY, JUNE 8, 9:00 A. M.**

*Presiding—ANNETTE M. CALLAN*

1. "What Has the Registry Done for the Medical Technologist?" ANNA R. SCOTT, Registrar, Denver, Colorado.
2. "Cultivation and Identification of Yeast-like Moulds." DR. C. J. BUCHER, Jefferson Hospital, Philadelphia, Pa.
3. "The Scientific Preparation of Physiological Solution of Sodium Chloride." ALEXANDER G. KELLER, Ph.G., B.Sc., Graduate Hospital, Philadelphia, Pa.
4. "The Planning of a Small Hospital Laboratory." BERNICE ELLIOTT, Clarkson Memorial Hospital, Omaha, Nebraska.

**TUESDAY AFTERNOON, JUNE 8**

VISITS TO THE A. M. A. EXHIBITS

**TUESDAY EVENING, JUNE 8, 5:30 P. M.**

SAILING PARTY

(See social activities)

**WEDNESDAY, JUNE 9, 9:00 A. M.**

*Presiding, ANNA M. H. FALCK*

1. "The Identification and Classification of the Cells of the Blood and Marrow." DR. EDWIN E. OSGOOD, University of Oregon, Portland, Oregon.
2. "Some Laboratory Findings in Sickle Cell Anemia." ANN SNOW, University of Arkansas, Little Rock, Arkansas.
3. "Methods in Photography." PHYLLIS STANLEY, Presbyterian Hospital, Newark, N. J.
4. "Discussion of Allergy Technique." DOROTHY MORRIS, Newport News, Virginia.

**WEDNESDAY, JUNE 9, 2:00 P. M.**

BUSINESS SESSION

ELECTION OF OFFICERS

**WEDNESDAY EVENING, JUNE 9, 7:30 P. M.**

FIFTH ANNUAL BANQUET

**REGISTRATION**

Members and guests are requested to register upon arrival—Registration Bureau, main foyer of the President Hotel.

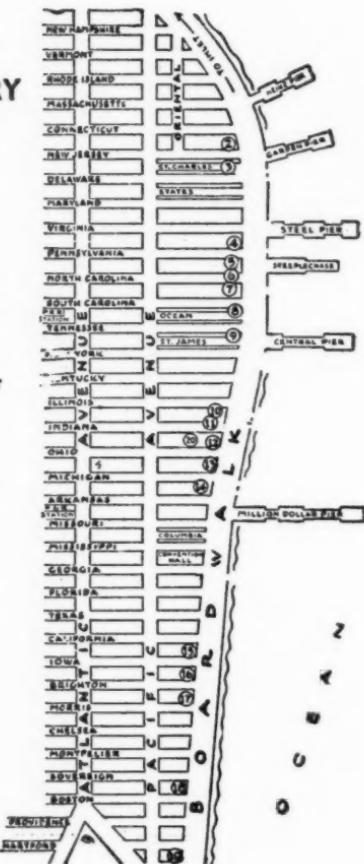
**EXHIBITS**

12 to 2 and 4 to 9 P. M. Daily.  
Admission will be limited to those wearing badges of the Society.

## DIRECTORY

### HOTEL DIRECTORY

- 2 Breakers
- 3 St. Charles
- 4 Seaside
- 5 Strand
- 6 Haddon Hall
- 7 Chalfonte
- 8 Belmont
- 9 Knickerbocker
- 10 Traymore
- 11 Brighton
- 12 Marlborough
- 13 Dennis
- 14 Shelburne
- 15 Ritz-Carlton
- 16 Ambassador
- 17 Chelsea
- 18 Ostend
- \* 19 President
- 20 Claridge

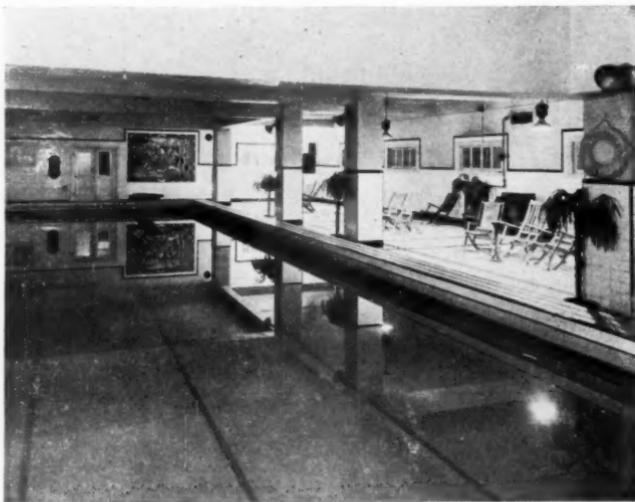


\*(19) President Hotel—National Headquarters.

*(The Sisterhood will reside at Knights of Columbus Hotel.)*



The Bronze Ball Room, President Hotel, one of the largest meeting rooms on the Eastern coast.



Sunshine Swimming Pool which has a continual flow of purified sea water will be at the disposal of guests attending the A. S. M. T. Convention.

# MARVIN-NEITZEL CORPORATION

*Official Outfitters to the*  
**American Society of Medical  
Technologists**

The laboratory coat illustrated made either from "manecor" Linen Finish Sheeting at \$2.25 ea. or White Army Duck at \$2.75 ea. has been selected as the official uniform of the A. S. M. T. and arrangements have been made with the Marvin-Neitzel Corporation of Troy, N. Y., to furnish these coats to members on orders originating from the administration office of the Association at 10439 Outer Drive East, Detroit, Michigan.

Write headquarters at Detroit for your instructions and order blank if you want to order one or more coats.



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